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[0011] Fixed dispersion compensator 16 can be constructed, for example, from a dispersion-compensating fiber (DCF) whose fiber core has a refractive index graded with a special profile in the radial direction thereof, thereby providing dispersion opposite in sign (i.e., negative) to dispersion (positive) in an ordinary SMF, or from a fiber grating dispersion compensator in which a Bragg grating with changing refractive index is formed in the fiber core to provide negative dispersion.

[0012] Variable dispersion compensator 18 can be constructed from the previously mentioned PLC dispersion compensator or from one in which the dispersion amount is varied by providing a stress gradient or temperature gradient to a fiber grating. An example of the latter type, i.e, the variable dispersion compensator achieved by applying a stress to the fiber grating (see M. M. Ohm et al., "Tunable Fiber Grating Dispersion Using a Piezoelectric Stack," OFC' 97 Technical Digest, WJ3, pp. 155-156), will be described as an example. As shown in FIG. 2, a piezoelectric element 24 is attached to each of 21 segments of a chirped fiber grating 22. When voltages V1 to V21 with a gradient such as shown in FIG. 3, are applied to the piezoelectric elements, the pressure being applied in the longitudinal direction of grating 22 changes, and for the voltage patterns A to D shown in FIG. 3, the dispersion values (slopes of the lines) change as shown in FIG. 4. Here, the dispersion values can, of course, be varied continuously by giving intermediate voltage patterns between those shown.